

REMARKS/ARGUMENTS

Applicants' representative would like to thank Examiner Goodrow for the courteous and helpful discussion of the issues in the present application on August 3, 2006. Applicants would like to thank Examiner Goodrow for the indication that the present application contains allowable subject matter. The above amendments and following remarks summarize and further expand on the content of that discussion.

Claims 1-4 and 6-20 are active in this application, claim 5 having been cancelled. Claims 1, 18, 19 and 20 have been amended to specify that the cured mono-functional radical polymerizable compound having a charge transporting structure has a functional group selected from acryloyloxy group, methacryloyloxy group and vinyl group (Applicants note that the discussion of August 3, 2006 between Applicants' representative and Examiner Goodrow discussed limiting the functional group to either acryloyloxy or methacryloyloxy. However, this did not take into account the Exemplary compounds 143 to 160 on pages 39 and 40 of the specification, which have a vinyl functional group. Accordingly, the amendment has included both the embodiments of claim 5 and the Exemplary Compounds 143 to 160.). This amendment is supported by original claim 5, and by the Exemplary Compounds 143 to 160 on pages 39 and 40 of the present application. Claim 7 has also been amended to define R1 as either H or methyl, and thus be within the scope of independent claim 1 from which it depends. No new matter has been added by these amendments.

The present invention relates to an electrophotographic photoconductor comprising an electroconductive substrate, and a photoconductive layer on or above the substrate. The photoconductive layer comprises a cross-linked surface layer which comprises (a) a cured tri- or more-functional radical polymerizable monomer without having a charge transporting structure; and (b) a cured mono-functional radical polymerizable compound having a charge transporting structure. The cross-linked surface layer is required to have a surface roughness

Rz of 1.3 μm or less. Further, the cured mono-functional radical polymerizable compound having a charge transporting structure is required to have a functional group selected from acryloyloxy, methacryloyloxy or vinyl.

The claims stand rejected under 35 U.S.C. 102(a) (more properly should be stated as 102(b)), over Kikuchi et al, or under 35 U.S.C. 103 over Maruyama et al, in view of Kashimura et al, Hashizume et al and Uematsu et al. None of the recited references teach the specific combination of the present invention, namely, none of the references teach a cross-linked surface layer comprising a **tri- or more-functional** radical polymerizable compound having **NO** charge transporting structure, and a **mono-functional** radical polymerizable compound **having** a charge transporting structure, where the mono-functional compound has a functional group selected from acryloyloxy, methacryloyloxy or vinyl, and wherein the surface layer has a surface roughness Rz of 1.3 μm or less.

Kikuchi et al disclose an electrophotographic photosensitive member. However, the photosensitive layer is required to have a layer comprising a polymerizate of a hole-transporting compound having at least two chain polymerization function groups (see Abstract). In particular, the photosensitive layer is disclosed in more detail beginning at column 125 of Kikuchi, which requires the layer to have a hole-transporting compound (i.e. a charge transporting structure) with at least two chain polymerization functional groups. In contrast, the compound of the present invention surface layer that has the charge transporting structure can only have a single radical polymerizable functional group (i.e. mono-functional). While Kikuchi et al disclose various embodiments of their photosensitive layer, in all cases, the hole transporting compound is required to have at least two chain-polymerization functional groups, either alone or in combination with such things as a hole-transporting compound having no chain-polymerizable groups. As such, Kikuchi et al cannot anticipate or suggest the present invention combination of (a) a tri- or more-functional radical

polymerizable compound having no charge transporting structure, and (b) a mono-functional radical polymerizable compound having a charge transporting structure, wherein the functional group present is acryloyloxy, methacryloyloxy or vinyl. Accordingly, the rejection should be withdrawn.

The rejection of the claims over the combination of Maruyama et al, Kashimura et al, Hashizume et al and Uematsu et al is likewise traversed on the grounds that none of these references disclose or suggest, alone or in combination, the specific combination of components present in the surface layer of the photoconductive layer of the present invention.

Each of Maruyama et al and Kashimura et al disclose electrophotographic photosensitive members in which the charge transporting compound is a non-polymerizable compound that is added to the photoconductive layer. In particular, Maruyama et al disclose that their photosensitive layer includes a charge generation layer and a charge transport layer. The charge transport layer contains a charge transporting material such as triarylamine compounds, hydrazone compounds, stilbene compounds, pyrazoline compounds, oxadiazole compounds, thiazole compounds and triarylmethane compounds (see column 15, lines 46-50). None of these would be considered by those of skill in the art as a mono-functional radical polymerizable compound having a charge transport structure. In fact, in the art the types of compounds disclosed by Maruyama et al are typically just added into the charge transport layer as an additive. Likewise, Kashimura et al discloses similar charge transporting substances including pyrenes, N-alkylcarbazoles, hydrazones, N,N-dialkylanilines, diphenylamines, triphenylamines, triphenylmethanes, pyrazolines, styryls, stilbenes and the like (see column 13, lines 51-55). As such, neither of these references can suggest the combination of the tri-or more functional radical polymerizable compound having no charge transport structure and a mono-functional radical polymerizable compound having a charge transport structure required by the present invention. Neither of these references

disclose the use of a radical polymerizable compound having a charge transport structure that becomes part of the surface layer of the photoconductive layer of the structure.

Uematsu et al disclose an electrophotographic photoconductor in which the photosensitive layer may be made of a monomer, oligomer or polymer which has no group chain-polymerizable with the hole-transporting compound, or of a monomer, oligomer or polymer which has a polymerizable group other than the chain-polymerizable one (see column 57, lines 5-9). Further, the hole-transporting structure within the photosensitive layer of Uematsu et al is required to be at least one of a hole-transporting compound having two- or more chain-polymerizing groups in the same molecule. Thus, as was the case with Kikuchi, the charge transporting structure of Uematsu et al must be located in a compound having two or more chain-polymerizing groups, whereas in the present invention, the charge transporting structure of the present claims is required to be present in a mono-functional radical polymerizable compound. This is nowhere disclosed or suggested by Uematsu et al.

In the case of Hashizumi et al, there is no disclosure of using a surface layer of the required combination of tri- or more-functional radical polymerizable compound with no charge transport structure and a mono-functional radical polymerizable compound having a charge transport structure. Hashizumi et al discloses the photoconductive layer as being composed of a non-single-crystalline material containing silicon atoms as matrix, and a surface layer of non-single-crystalline carbon material, and containing at least oxygen, nitrogen, fluorine and boron atoms. Nothing within this disclosure would suggest the composition of the surface layer of the present invention. This is further borne out by the fact that the Examiner has only used this reference for teaching of the surface roughness of the surface layer. However, since the surface layer composition is completely different in the present invention, relative to that of Hashizumi et al, and none of the other references

disclose or suggest the present invention surface layer of the photoconductive layer,
Hashizumi et al cannot combine with the references to overcome their deficiencies.

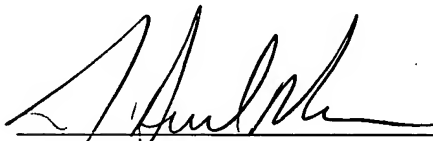
None of the references cited by the Examiner disclose or suggest the particular combination of the present invention, wherein the surface layer of the photoconductive layer must comprise a tri-or more functional radical polymerizable compound that contains NO charge transport structure, and a mono-functional radical polymerizable compound having a charge transport structure, wherein the mono-functional radical polymerizable compound has a functional group selected from acryloyloxy, methacryloyloxy or vinyl and having a surface roughness of the surface layer Rz of 1.3 μm or less. As such, the rejections should be withdrawn.

The claims also stand provisionally rejected under the doctrine of obviousness type double patenting over claims 1-37 of copending application 10/804,043. This rejection has been obviated by the filing herewith of a terminal disclaimer.

Applicants submit that the application is in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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